CALIFORNIA
OCCUPATIONAL GUIDES

EDD Employment Development Department
State of California

STATIONARY ENGINEERS AND BOILER OPERATORS

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INTEREST AREA
REALISTIC

WHAT DOES A STATIONARY ENGINEER AND BOILER OPERATOR DO?

STATIONARY ENGINEERS AND BOILER OPERATORS maintain and operate boilers, engines, generators, compressors, and related equipment such as pumps and fans. These systems provide power, heat, air conditioning, and refrigeration for buildings and manufacturing facilities. Depending on where they work, Stationary Engineers and Boiler Operators also service industrial machinery, hospital equipment, plumbing fixtures, elevators, and other electrical or mechanical devices used on the premises.

These Engineers are responsible for the safe, efficient operation of all systems under their control. They make regular inspections of equipment areas, reading meters and gauges, listening to the machinery, and adjusting the controls. They perform periodic tests and take corrective action, such as adding chemicals to the boilers to prevent corrosion and scale. In large, automated facilities, Engineers in a central control room monitor conditions throughout the plant by watching video display terminals and checking computer printouts that show instrument readings from machinery in remote locations. By entering commands at the main computer terminal keyboard, they can make necessary adjustments.

If machinery breaks down or malfunctions, Engineers locate the source of trouble and repair or arrange for the necessary repairs. Using hand and power tools, they may replace or modify defective parts, fabricate new parts, or completely overhaul the equipment. When necessary, they contact the equipment manufacturer or call in the appropriate specialist. For each shift, Engineers keep a log of test results, instrument readings, and any preventive or corrective maintenance work performed. In many establishments, Stationary Engineers and Boiler Operators handle all aspects of the job; in others, apprentices, helpers, or maintenance personnel assist them.

In most facilities the Stationary Engineering staff are considered the first to emergencies such as fire alarms, hazardous waste spills, and homeland security. They maintain records for the annual fire inspection of a facility.

Stationary Engineers and Boiler Operators perform the following tasks:

- Inspect equipment to determine need for repair, lubrication, or adjustment.
- Adjust controls and valves on equipment to provide power and regulate and set operations of system and industrial processes.
- Light burners and open valves on equipment, such as condensers, pumps, and compressors, to prepare system for operation.

- Read dials of temperature, pressure, and ampere gauges and meters to detect malfunctions and ensure specified operation of equipment.
- Lubricate, maintain, and repair equipment, using hand tools and power tools.
- Add chemicals or tend equipment to maintain temperature of fluids or atmosphere or to prevent scale buildup.
- Test electrical system to determine voltage, using voltage meter.
- Record temperature, pressure, water levels, fuel consumption, and other data at specified intervals in logbook.
- Clean equipment, using air hose, brushes, and rags, and drain water from pipes and air reservoir.
- Tend boilers and equipment to supply and maintain steam or heat for buildings, marine vessels, or operation of pneumatic tools.
- Move controls and observe gauges to regulate heat and steam.
- Ignite fuel in burner using torch or flame.
- Install burners and auxiliary equipment, using hand tools.
- Shovel coal or coke into firebox to feed fuel, using hand tools.
- Obtain samples from designated location on boiler and carry samples to testing laboratory.
- Test sample quality to ensure sample meets specifications, using testing devices.
- Clean and maintain heating and steam boilers and equipment, using hand tools.
- Record test results on specified form and give to worker or supervisor.

WHAT SKILLS ARE IMPORTANT?

Important skills, knowledge, and abilities for Stationary Engineers and Boiler Operators include the following:

- Operation and Control – Controlling operations of equipment or systems.
- Equipment Maintenance – Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.
- Operating and Monitoring – Watching gauges, dials, or other indicators to make sure a machine are working properly.
- Troubleshooting – Determining causes of operating errors and deciding what to do about it.
- Repairing – Repairing machines or systems using the needed tools.
- Mechanical – Knowledge of machines and tools, including their designs, uses, repair, and maintenance.
- Engineering and Technology – Knowledge of the practical application of engineering science and technology. This includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services.
- Manual Dexterity – The ability to quickly move your hands, or arms to grasp, manipulates, or assembles objects.
- Problem Sensitivity – The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.

WHAT'S THE WORK ENVIRONMENT?

Stationary Engineers and Boiler Operators work in food processing and other industrial plants, hospitals, hotels, airports, and other large building complexes. Some travel to perform maintenance work for building service firms. Equipment rooms may be noisy or hot, while control rooms are quiet and cool. Some engineers are stationed in one location, such as a central control room or high-pressure boiler plant, which requires continuous attention. Others circulate throughout a facility, checking each piece of equipment. Considerable standing and walking are required. Work areas are generally clean. However, when repairing machinery, Stationary Engineers and Boiler Operators are exposed to dust, grease, and oil and may have to stoop, kneel, or crouch for extended periods of time.

Union Membership

Many Engineers belong to a local chapter of the International Union of Operating Engineers. Some belong to industrial unions or unions representing

government employees. Engineers may also join related groups such as the National Association of Power Engineers.

WHAT'S THE CALIFORNIA JOB OUTLOOK?

The following information is from the occupational projections produced by the Employment Development Department (EDD) Labor Market Information Division (LMID):

Stationary Engineers and Boiler Operators

Estimated number of workers in 2002:	6,300
Estimated number of workers in 2012:	6,500
Projected Growth 2002-2012:	3.2%
Est. openings due to separations by 2012:	1,200

These figures do not include self-employment.

This occupation will grow slower than average compared with all occupations in California. There will be a total of 1,400 job opportunities in this occupation from 2002 through 2012. The total number of annual job opportunities in this occupation will average 140.

Trends

The trend toward automated, centralized control of building operations will not reduce the need for Stationary Engineers and Boiler Operators. When automated systems are installed in older buildings, they often take the place of simpler systems and equipment that had not required the high-level services of Stationary Engineers and Boiler Operators. Further, Stationary Engineers and Boiler Operators not only operate, but also maintain these sophisticated systems. Automated systems typically require fewer operators but more maintenance personnel. Technically trained engineers must also be available to take over manual controls if the automated system should fail.

WHAT DOES THE JOB PAY?

California Earnings

The following information is from the Occupational Employment Statistics Survey of Employers by EDD/LMID:

Stationary Engineers and Boiler Operators
2005 Wages

Hourly wages range from	$21.94	to	$32.59
Average hourly wage	$26.75		
Average annual wage	$55,651		

These figures do not include self-employment.

Wages for Stationary Engineers and Boiler Operators vary with the industry in which they are employed, the location in which they work, and their level of responsibility.

Hours

Engineers generally work eight hours a day, 40 hours a week. However, in plants or facilities that operate around the clock, Engineers often rotate night and weekend duty with extra pay for working late shifts. Engineers on rotating shifts may work six or seven days at a stretch and then get two to four consecutive days off. Engineers may also be called to work at any time to handle emergencies at a higher rate of pay.

Benefits

Most employers provide benefits such as vacations, sick leave, medical insurance and retirement programs.

HOW DO I PREPARE FOR THE JOB?

Education and Training

Some Stationary Engineers and Boiler Operators begin as maintenance or refrigeration mechanics. Over many years, they may pick up additional skills on the job. Related training and maintenance experience may be obtained in the navy or merchant marines. Formal apprenticeship programs are the fastest and surest way to learn and enter the trade. Stationary Engineer and Boiler Operator apprenticeship programs combine four years of on-the-job training with classroom instruction in subjects such as physics, electricity, electronics, blueprint reading, steam boilers, air conditioning, refrigeration, and welding. Persons who are not in apprenticeship training should supplement their work experience with community college, trade school, union training facilities, or home study courses in these subjects.

Apprenticeship programs are sponsored by joint labor-management apprenticeship committees located in various parts of the State. New apprentices are selected at least every two years. Candidates must be at least 18 years old and have a high school diploma or GED certificate. Applicants must also pass a written examination and personal interview. High school courses in mathematics, physics, chemistry, electronics, mechanical drawing, and machine shop are helpful but not required.

Licensing and Certification

The State does not require licensing or certification for Stationary Engineers and Boiler Operators. Many employers, however, require Environmental Protection Agency 608 Universal Technician Certification and some cities or counties require licensure for Steam Engineers and High Rise Fire Safety Director Certification. Training and certification to handle asbestos, lead, and mold problems in building is sometimes needed.

Continuing Education

While Stationary Engineers and Boiler Operators are not required to attend specific classes or training, journey-level engineers must continue to keep abreast of new technological developments. To help them do so, the unions provide classes and correspondence courses for members.

HOW DO I FIND THE JOB?

Applicants for apprenticeship programs should inquire at district offices of the International Union of Operating Engineers. Journey-level Engineers usually find work through their union or by direct application to employers.

The majority of jobs are with State and local government. Engineers seeking government jobs must pass civil service examinations. Those who pass the written exam and the screening process can be hired into jobs as openings occur.

Direct application to employers remains one of the most effective job search methods. Search these **yellow page** headings for specific organizations:

- Colleges and Universities
- Elementary and Secondary Schools
- Engineers-Industrial
- Engineers-Manufacturing
- Food Processing Plants
- Hospitals
- Hotels and Motels
- Public Utilities

The following Internet resources can be helpful to the job search process:

America's Career InfoNet
www.acinet.org

America's Job Bank
www.ajb.dni.us

CalJOBS℠
www.caljobs.ca.gov

Job Search and Resume Writing
www.worksmart.ca.gov/success_tips_menu.html

Local Job Service Offices
www.edd.ca.gov/jsrep/jsloc.htm

Occupational Information Network (O*NET) Online
http://online.onetcenter.org

One-Stop Career Centers List
www.edd.ca.gov/ONE-STOP/pic.htm

For statewide and local projections, wages, employers by county, and other occupational information go to www.labormarketinfo.edd.ca.gov and select *Find an Occupation Profile*.

WHERE CAN THE JOB LEAD?

Journey-level engineers may become senior or assistant chief engineers, whose job is to supervise workers and activities on a single shift. Some advance to chief engineer or to superintendent of buildings and grounds with responsibility for all facility operations.

OTHER SOURCES OF INFORMATION

Information about apprenticeship programs may be obtained from:

International Union of Operating Engineers
Stationary Engineers Local 39
560 Barneveld Avenue
San Francisco, CA 94124
(415) 285-3939
www.local39training.org

International Union of Operating Engineers
Stationary Engineers Local 501
2405 West Third Street
Los Angeles, CA 90057
(213) 385-1561
www.local501.org

International Union of Operating Engineers
1125 17th Street, NW
Washington, D.C. 20036
www.iuoe.org

National Association of Power Engineers, Inc.
One Springfield Street
Chicopee, MA 01013
(413) 592-6273
www.powerengineers.com

Department of Industrial Relations
Division of Apprenticeship Standards
455 Golden Gate Avenue, 8th Floor
San Francisco, CA 94102
(415) 703-4920
www.dir.ca.gov/DAS/das.html

RELATED OCCUPATIONAL GUIDES

Heating, Air Conditioning, and Refrigeration Mechanics	No. 32
Industrial Machinery Mechanics	No. 136
Drinking Water Treatment and Distribution Operators/ Wastewater Treatment Plant Operators	No. 443

OCCUPATIONAL CODE REFERENCES

SOC *(Standard Occupational Classification)*

Stationary Engineers and Boiler Operators	51-8021

O*NET *(Occupational Information Network)*

Boiler Operators and Tenders, Low Pressure	51-8021-01
Stationary Engineers	51-8021-02

OES *(Occupational Employment Statistics)*

Stationary Engineers and Boiler Operators	95032